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AUTHOR Gibbs, Gloria S.
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ABSTRACT

This study is a survey and analysis of literature related to the current future movement and its implications for educational practice. The results of this study indicate that even though futurists are varied in their ideas and approaches, there is general agreement among those surveyed on the following: (1) there is a noticeable stance among educators of past and present orientation; (2) changes are forcing more educators to look to the future; (3) the educational system lags behind other institutions in responding to change; (4) the study of the future should be the concern of all learners; and (5) there is a need for recognizing the importance of fusing a futuristic orientation to all aspects of the curriculum -- elementary, secondary, and collegiate. Besides the proliferation of books, articles, and media devoted to futurism, there is evidence that college courses have grown with extreme rapidity in emphasizing futurism. There is evidence that futurism has value for preservice and inservice preparation. (Author)

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A SOCIETAL FACTORS ISSUE

THE ROLE OF THE FUTURE IN EDUCATIONAL PRACTICE

A SOCIETAL FACTORS ISSUE

U.S. DEPARTMENT OF HEALTH,
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GLORIA S. GIBBS

UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE

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A SOCIETAL FACTORS ISSUE
THE ROLE OF THE FUTURE IN EDUCATIONAL PRACTICE

GLORIA S. GIBBS
UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE

INTRODUCTION

The most current and pervasive movement affecting education is a concern with the future. The new movement is identified by a variety in terminology, such as "futuristics," "futurology," "future studies," or "futurism" which the researcher has found to be interchangeable terms.

The purpose of this practicum was to provide the investigator with a basis for introducing concern with the future in teaching strategies in the teacher education program in the College of Education. One of the serious deficiencies in the field of education is that many creative educational strategies are practiced in other fields with significant success long before they have a similar impact on classroom practice. Consequently, there is a need to make more practical application of future awareness. Similarly, as in environment, business, technology, industry, government and culture curricula for teacher preparation should also stress future awareness.

Moreover, it has been advocated by many futurists that there is a need to pay attention to the future at all educational levels. Hence, it was assumed by the investigator that it is particularly needed in pre-and inservice education.

Thus this practicum undertaken by the investigator included (1) a survey of the growing range of futuristic literature, (2) an analysis of future studies and its implications for educational practice, and (3) some specific strategies and techniques for bridging the gap between theory and practice in relation to futurism.

BACKGROUND AND SIGNIFICANCE

Many educators concerned with curriculum development are grappling with the problem of how to counteract the past and present orientation which still has a strong hold on college, secondary, and elementary curriculum. In spite of the present concern and interest among many in the futuristic movement, many individuals are still prone to cherish and maintain the status quo by resisting and blocking change. This is particularly true from the researcher's experience in working directly with needed change in curriculum development for teacher preparation.

Alvin Toffler (1971), a contemporary futurist coined the phrase "future shock" which suggests the individual's reluctance to adjust to and to accept the rapid change in his life and society. Toffler's popularizing of this concept and his concern with the problem of "cope-ability" has strong implications for educators. In addition, the importance of paying more attention to futurism in educational practice is somewhat analogous to the education of the "whole child" concept. The future movement by emphasizing the importance of future awareness in education adds a unique dimension to the total educational process.

Writing in Learning for Tomorrow Toffler (1974) made the following comments on the purpose of futurism in education:

The ultimate purpose of futurism in education is not to create elegantly, complex, well-ordered, accurate images of the future, but to help learners cope with real-life crises, opportunities and perils. It is to strengthen the individual's practical ability to anticipate and adapt to change, whether through invention, informed acquiescence, or through intelligent resistance.

To meet this challenge, there is considerable evidence that experiments in futurism are going on in college, secondary, and elementary curriculum. Resources and ideas from the works of teachers have been pulled together to provide a model for resource training centers at all educational levels.

Hence, this practicum was undertaken for the purpose of (1) determining the present impact of futurism, and (2) initiating some attention to the concept in pre-and inservice professional preparation. Although futuristic techniques, which have been pioneered in industry, are applicable to societal problems as well as to educational practice, it is important to note that to many it is still considered an irrational form of thinking. But on the other hand, futurism has had a long history in Europe and is now in vogue with American intellectuals. Needless to say, it is also threatening to many past-and present-oriented educators and individuals to see the necessity of thinking of alternate futures.

William Van Til (1974) made the following comment supporting this view:

A frequent criticism of futurism is that it is escapist. Futurists are charged with dodging present problems by keeping their heads in the clouds of the future. Actually the opposite is true. Studying alternative futures is a way of clarifying the alternative courses and possible value options available in the present.

In other words, the study of alternative futures is a highly effective method of forcing human beings to confront their present problems and to consider the results of their present choices.

Although futurists are varied in their ideas and approaches, the stage has been set to bridge the gap between past and present in relation to the future. It is generally agreed among professional futurists in industry or educational circles that the study of alternative futures is a way of clarifying the alternative courses possible. This can also be a highly effective way of forcing individuals to realize that their actions may be greatly influenced or modified by what is done in the present.

PROCEDURES

The procedures and research methods followed in carrying out this practicum in Societal Factors were as follows:

1. A survey of literature devoted to future studies.
2. An analysis of futuristic studies and its implications for educational practice.
3. A tabulation of the first results of a Delphi (forecasting technique) devised by the researcher for the purpose of assessing Nova peer cluster members' ability to think about the future in relation to "Urbanization."

*Only first results are reported on the use of the Delphi because of time limitations of a panel assignment devoted to urbanization. This futuristic technique is merely used in results of this practicum for illustrative purposes.

The following section will be devoted to the results of the practicum.

RESULTS

The results of this practicum are divided into three sections: (1) the first section is a general survey of future studies in relation to various educational levels, (2) the second section is an analysis of future literature and its implications for educational practice, and (3) the final or third section is devoted to specific techniques utilized in industry and government which have direct application to educational practice.

Salient points to consider in a study of futurism is its terminology and its divisions of growth. In the review of literature varied terminology is used--futuristics, futurology, futurism, and future studies. Although futurists are varied in their views, the terminology or the descriptive terms are used interchangeably. Another salient point to consider in the study of the futuristic movement is that, like other movements, there is a distinct division in its growth period. Harold G. Shane (1971) has listed three categories into which the literature can be sorted as of the early 1970s.

1. Statements regarding broad, current problems (e.g. pollution) and presumably promising practices (e.g. ocean farming or the "new city" concept intimately related to possible world features.
2. Forecasts and conjectures as to likely happenings, assuming a surprise free future, in the realms of science, the arts,

domestic politics, international relations, biochemistry, morals, and so on.

3. The actual techniques and procedures of future scanning and future planning: variations of the Delphi technique, applications of PERT -ing and systems analysis, scenario writing and game theory, etc.

It is also important to note that attention to speculative thinking was going on long before its direct application to educational problems and practices. Before the seventies the closest concern with educational implications of future tactics for teacher education was done by William Van Til (1968). Van Til proposed some alternatives for education in The Year 2000: Teacher Education. In this publication Van Til is representative of serious speculative thinking concerning alternatives available to American education as a whole.

Herman Kahn and Anthony J. Weiner (1967) provided futurists in Daedalus, a helpful framework for speculating concerning the future; however, no implications were drawn for curriculum.

In the third category of writings devoted to futurism listed by Shane, the researcher found that for current information the magazines, Nations Schools and the Journal of Teacher Education are excellent resources for helping practicing educators keep abreast of the latest thinking of futurism in the field of education.

In addition, there appears to be general agreement among futurists surveyed of the following: (1) there is a noticeable stance among educators of past and present orientation, (2) changes are forcing educators more and more to look to the future, (3) the educational system lags behind other institutions in

responding to change, (4) the study of the future should be the concern of all learners, and (5) there is a need for recognizing the importance of fusing a futuristic orientation to all aspects of the curriculum--elementary, secondary and collegiate. Besides the proliferation of books, articles, and media devoted to futurism, there is evidence that college courses have grown with extreme rapidity in emphasizing futurism.

The following section will provide some illustrative application of future studies at different school levels.

Billy Rojas (1974) created the first graduate school at the University of Massachusetts School of Education which allowed a major concentration in future research. He strongly advocated the introduction of the future as a "generalized stimulus" for educational change. A colleague of Rojas, H. Wentworth Eldredge, professor of sociology at Dartmouth College where he teaches "Futurism and Long-Range Planning" and has been involved in the educational futures movement from its inception, also taught "The Future of Urbanism and Cities" in 1967 at Berkeley. An informal survey done by Rojas and Eldredge indicated that within an approximate ten year span that it was difficult to find a college or university without some kind of academic work in the field of future studies. According to statistics in their survey approximately four hundred schools in the U.S. plus a modest number in foreign countries include futurism in their curricula. The future course is usually included under the rubric of a traditional department or as part of an interdisciplinary program. The data following illustrate the rapidity with which future studies have grown. Although their report was partial rather than

exhaustive, it does, however, give an indication of how courses have grown as shown in these results:

YEAR	NUMBER OF SCHOOLS OFFERING FUTURE STUDIES
1968	16
1969	30
1970	75
1971	200

In addition to the inclusion of future studies at the college and graduate level, future studies have also been introduced in high schools across the country. It appears that the first pre-college level course was taught at Melbourne High School near Cape Kennedy (Griffith, 1974). The courses focussing on the future cover a wide range of topics such as race relations, intelligence, and urbanization and consisted of fifteen units. The fifteen units begin with an "Introduction to the Future" and end with a unit which asks the question, "What is Man?" The course with the fifteen units supplemented by teaching devices, games, and simulations incorporated by Toffler was named the "Twenty-First Century" suggesting its combination of academic excellence with a future orientation.

Another interesting move made in high school was done by McDaniel (1974) who has devised a model for a revolutionary secondary curriculum for a futuristic focus for high school. He designed a ten through twelve curriculum which would start at the tenth grade level and progress in the following manner:

1. A general cultural approach at the tenth grade level which will enable students through careful guidance to learn about culture itself through an analysis of myths, jokes, artifacts, buildings, marriage rites, and ruling bodies.
2. In the eleventh grade would be included a series of case studies that parallel the general topics and periods of traditional American history. The topics are chosen and studied for their relationship to, and impact on the present and future, i.e., "The Westward Movement."
3. The three basic modules for the twelfth grade course are: Possible Futures, Probable Futures, and Preferable Futures.

The preceding section illustrated how futurists have taken direct action to insure that a futuristic orientation is incorporated in aspects of the curriculum at both pre-college and graduate levels. The next section will be devoted to a short summary of how futurism is affecting the field of teacher education practices.

Joel L. Burdin (1974), Associate Director of AATE (American Association of Colleges for Teacher Education) and editor of the Journal of Teacher Education, is representative of other futurists who feel that educators must use and see futurism as keeping schools in the mainstream. Joel L. Burdin, who has defined futurism as an "intellectual imaginative projection of emerging phenomenon" also sees futurism as a tool to be used by those responsible for pre-and inservice teacher education.

Dean C. Corrigan, Dean of the College of Education at the University of Vermont has taken similar views to Burdin concerning the "futures perspectives" of teacher preparation. Corrigan (1974) pointed out that in the future teachers and other personnel will perform a broader range of human services. Both educators (Burdin and Corrigan) see education as a team process in which the present role of

the educator will be changed. With the present trend to make learning more individualized and personalized, the personnel must represent a variety and diverse talent. Corrigan summarized the major roles of educators for a team personnel of the future:

Teaching teams will include specially trained professionals who work not only with children and youth but also with teachers. For example, to the usual specialization areas of subject matter and age level will be added a variety of specializations that will focus less on the teacher as a content specialist and more on the teacher as a specialist in the nature of learning and the use of learning resources. Teaching staffs will include research associates, learning diagnosticians, visual literacy specialists, computer-assisted instruction specialists, system analysis and evaluation experts, specialists in simulation and gaming techniques, information systems and data based designers and community education teachers.

The above summary shows evidence of the necessity of educators and particularly those involved in teacher preparation to (1) immerse themselves and become knowledgeable about futuristic literature, and (2) to consider guidelines which can be followed for providing a perspective for professional development as it affects the present and future.

The following section will be devoted to an analysis of the value of futurism and its implications for education.

The futuristic movement, in the researcher's view, raises some controversial questions as has other movements. The following two questions may be posed: (1) Is futurism (future studies, futurology, futuristics) a perspective for looking at subject matter in all disciplines or an academic discipline? or (2) Should it become

an element in all courses; i.e. integrated or should it be taught as a separate subject? It is clear that the early enthusiasts in the field taught their courses as separate disciplines. The final test will come when more educators experience the importance of fusing future research or techniques in all areas of the curriculum. Joel L. Burdin made the following statement in favor of the integrated approach to futurism:

It is unwise to develop separate courses on any educational level labeled "the future." It is essential to incorporate a futuristic orientation in all aspects of the curriculum on the elementary-secondary-collegiate level. The future must become one of the conceptualizing tools and organizational topics in disciplines such as science, psychology, sociology, history, political science, and philosophy.

It is the writer's opinion that futurism should be approached from a variety of disciplines for the following reasons: First, there is a varied background among teachers. Second, consideration should be given to individual teaching styles and the subject preferences of teachers. On the other hand, in many instances it may be wise to include futurism as a separate discipline for the purpose of making headway. But this should be an initial step to full acceptance in any curriculum.

In sum, one dominant theme in future projection is that education is a continuing process. In the past, there was a focus on distinct separation of the various educational levels, including a separation of higher education and teacher training from other school systems and personnel. A major influence on this thinking is the concept of "longevity" (Jungk and Galtung, 1971) which implies that education is a lifelong commitment. Educators should stress the

importance of promoting future thinking among men and women of all ages. The future belongs to everyone and "futurism" should not be left to the experts in large corporations, governmental departments and the military establishment.

The preceding section of this study presented a general survey of future studies in relation to various educational levels, and an analysis of future literature and its implications for educational practice. The final and third section will be devoted to specific techniques (futuristic) which have direct application to educational practice. A description will follow of three futuristic techniques: (1) the Delphi, (2) the Scenario, and (3) Trend Analysis. These are three tools utilized by professional futurists and are relevant to education both in theory and direct application.

The first futuristic technique to be considered is the "Delphi." The Delphi questionnaire developed by the researcher consisted of five questions (See Appendix). The instrument was utilized in the fall of '74 in the Societal Factors seminar conducted by Professor Max Raines in Chicago. As a member of a panel of seven assigned to discuss the topic of "Urbanization" the researcher used this instrument to follow the distribution of responses of cluster members' thinking about the future in relation to urbanization. It is important to note, as pointed out earlier, that the Delphi designed by the writer is merely used in the results of this study for illustrative purposes. It is necessary to clarify the procedure used by the researcher in utilizing the Delphi. The Delphi instrument preceded an introduction by the researcher to the philosophy of Paola Soleri, futuristic architect and builder of Arcosanti, Arizona. Paola Soleri (1960, 1971),

a speculative thinker in urban planning, has taken a futuristic approach to create better cities. Soleri's (1971) solution to our deteriorating cities, population increase, and ecological decay is his concept of "Arcology" (architecture plus ecology or a new city built in the image of man). Functionally, an arcology is simply a more efficient machine to live in.

What is Delphi? Basically, the Delphi is a questionnaire developed by Rand Corporation and has been used by industry and government for a number of activities -- including long-range planning, forecasting, and decision making. Questions are devised to ask a respondent when he thinks a particular event will take place, or if he thinks it will take place at all. The rationale behind this technique is that responses from a panel of experts are believed to be a more reliable guide to future events than trust in any single source. Olaf Helmer (1967) of the Rand Corporation pointed out that this technique depends heavily on judgment. It replaces the traditional procedure for arriving at a consensus among a panel of experts involved in a round-table discussion of problems. The traditional procedures have been open to a number of objections, namely, the outcome of compromise among divergent views, arrived at usually under the specious persuasion of a panel leader with authority, or the strongest voice, the reluctance to drop a popular opinion, and the magic loyalty of the "bandwagon effect" or majority opinion.

In sum, the Delphi overcomes these difficulties in the following ways:

(1) the committee work among experts is eliminated and replaced by (2) a designed program of interrogations conducted usually by a questionnaire. The

responses simply consist of a set of estimates spread over a time interval.

As mentioned earlier, the results of a questionnaire designed by the researcher relating to urbanization projections based on responses from 25 cluster members are listed in the following tables. The tables show the distribution of responses.

Question: In what year will the population of the U.S. exceed 300 million?

Table 1

		Year				
		Responses				
1980	1990	2000	2020	2040	NEVER	
4	5	6	4	2	4	
16%	20%	24%	16%	8%	16%	

Question: In what year will our urban communities become carless?

Table 2

		Year				
		Responses				
1980	1990	2000	2020	2040	NEVER	
2	2	3	0	2	16	
8%	8%	12%	--%	8%	64%	

Question: In what year will there be no alarm over air pollution and urban crowding?

Table 3

Year					
1980	1990	2000	2020	2040	NEVER
Responses					
0	0	5	2	12	15
Percentage					
-- %	-- %	20%	8%	3%	60%

Question: In what year will most houses be constructed of synthetic materials?

Table 4

Year					
1980	1990	2000	2020	2040	NEVER
Responses					
15	2	4	3	1	0
Percentage					
60%	8%	16%	12%	4%	--%

Question: In what year will large-scale dismantling and demolition of New York, Chicago, Los Angeles, and Montreal take place and be rebuilt as three-dimensional developments?

Table 5

Year					
1980	1990	2000	2020	2040	NEVER
Responses					
1	3	3	3	3	12
Percentage					
4%	12%	12%	12%	12%	48%

In analyzing the results of the Delphi designed by the researcher, it is important to note as stated by Helmer earlier that responses are based heavily on judgment rather than a mathematical model. In the immediate future, as shown in Tables 1, and 4, the amount of uncertainty is very minor since it is usually assumed that present conditions will continue to prevail. And the farther away the projections are made into the future, the more uncertain the respondents' images of the future become. The results shown in Tables 2, 3, and 5 illustrate how the respondents rely on judgment in discerning which possibilities of future environments are most likely to occur.

As an addenda to the results described above, a follow-up in using this technique is as follows: First, send the results from the first tabulation back to the experts so that during the second or third tabulation their answers will tend

to converge. The second futurist tool is tabulation including the persons who are at the end of the continuum. The reason for their answers. Had this been done the futurists (i.e. experts on "urbanization") would have designed a set of alternative futures on the basis of the probable date. Again, the range the experts arrive at is only as accurate as their ability to predict the future. But the distribution of responses from a panel is based on the assumption that a panel, as stated earlier, can present a more accurate guide to events than one source.

In summary, the Delphi technique is a simple forecasting instrument modifiable not only for college use but also for secondary and elementary use. The technique promotes divergent thinking because there are no right answers.

The second futurist tool, used by professional futurists, is future "histories" or the scenario. The scenario is used by professional futurists to design alternative futures. The scenario is drawn from the literary method, whereas the Delphi is closer to the jury system and polling procedures. A teacher at any level can use this technique in the same manner. It is particularly applicable to history or the social studies. The scenario, designed by Herman Kahn (1967), is a narrative that combines the future with a history leading up to it. For example, a student or writer begins by describing the future state of x (say urbanization in 2000) and tries to construct a probable evolution of the events which lead up to this future state. This is another example of a simple, yet sophisticated way to predict and is modifiable at any educational level to encourage students to unleash their imaginations and to project their own view of the future on paper. The technique is also good motivation for developing positive self images in elementary pupils.

It encourages them to consider alternative futures for their lives.

The third and final technique used by professional futurists and applicable to classroom is known as "trend analysis." This technique enables a student to identify trends in a certain area and then project them into the future. Through the use of appropriate data, their own knowledge, the student is able to construct a graph to illustrate and compare a desirable future. Thus, the present becomes a basis by which the scenario approach can be used to talk about what needs to be done to help insure a desirable future.

These three futurist techniques--the Delphi, scenario, and trend analysis, all have direct application to educational practice at all levels. Their use helps to dramatize and explicate new concepts, develop a future consciousness, and generate imaginative thinking on the part of the individual or student.

RECOMMENDATIONS

Because there is evidence that futurism has implications for and is affecting teacher education practice for pre-and inservice teacher educator, a curriculum instructor can do the following: Take an active role in the initiation of more creative teaching strategies focusing on future awareness by (1) incorporating the three techniques described herein in instruction, and (2) encouraging more teacher-trainees to utilize these techniques in the teaching of social studies and other subject areas.

The following recommendations are appropos to a Department of Curriculum, Instruction and Evaluation:

1. Make futuristic literature more accessible to students by placing it in pre-service curriculum libraries.
2. Include future studies as it relates to educational practice as a component of the creative aspects of teaching at the elementary level for both preservice and inservice training labs and workshops.

REFERENCES

Bentzen, Mary., and Kye, Kenneth A. "Effective Change in Elementary Schools" The Elementary School in the United States. The Seventy-Second Yearbook of the National Society for the Study of Education, Part II, Chicago: University of Chicago Press, 1973.

Burdin, Joel L. "Futurism as a Focus in Instructional Planning," Journal of Teacher Education. XXV, 2, (Summer, 1974), 141-48.

Corrigan, Dean C. "The Future Implication for Preparation of Education Personnel," The Journal of Teacher Education. XXV, 2, (Summer, 1974), 100-07.

Griffith, Priscilla P. "Teaching the Twenty-First Century in a Twentieth Century High School," Learning For Tomorrow. ed. Alvin Toffler. New York: Random House, 1974. pp. 197-216.

Helmer, Olaf. "The Delphi Technique and Educational Innovation" ed. Werner J. Hirsch. Inventing Education for the Future. San Francisco: Chandler Publishing Co., 1967. pp. 74-96.

Hirsch, Werner Z. Inventing Education for the Future. San Francisco: Chandler Publishing Co., 1967.

Joyce, Bruce R. "The Curriculum Worker of the Future" The Curriculum: Retrospect and Prospect, The Seventieth Yearbook of the National Society for the Study of Education, Part I, Chicago: University of Chicago Press, 1971.

Jungk, Robert., and Galtung, Johan, ed. Mankind 2000. London: Allen and Unwin, 1971.

Kahn, Herman, and Weiner, Anthony J. "The Next Thirty-Three Years: A Framework for Speculation" Daedalus 96 (1967) 711-16.

McDaniels, Michael A. "Tomorrow's Curriculum Today" Learning for Tomorrow. ed. Alvin Toffler. New York: Random House, 1974. pp. 103-131.

Osgood, Charles E. and Umpleby, Stuart. "A Computer Based System for Exploration of Possible Futures for Mankind 2000" A Progress Report, Urbana: University of Illinois, 1973.

Reich, Charles. The Greening of America. New York: Random House, 1971.

Rojas, Billy. "Futuristics, Games and Educational Change: Learning for Tomorrow." Learning for Tomorrow. ed. Alvin Toffler. New York: Random House, 1974, pp. 217-223.

Sand, Ole. "Curriculum Change" The Curriculum: Retrospect and Prospect. The Seventieth Yearbook of the National Society for the Study of Education, Part I, Chicago: University of Chicago Press, 1971.

Scribner, Jay D., and Knox, Owen. "The Urban Elementary School Today" The Elementary School in the United States. The Seventy-Second Yearbook of the National Society for the Study of Education, Part II, Chicago: University of Chicago Press, 1973.

Shane, Harold G., and Shane, June G. "Future Planning and the Curriculum" Phi Delta Kappan 49 (1968) 372-77.

Silberman, Charles. Crisis in the Classroom. New York: Vantage Books, 1970.

Soleri, Paola. Arcology: The City in the Image of Man. Cambridge: MIT Press, 1971.

Soleri, Paola. The Sketchbook of Paola Soleri. Cambridge: MIT Press, 1971.

Toffler, Alvin. Future Shock. New York: Random House, 1970.

Toffler, Alvin, ed. Learning for Tomorrow. New York: Vantage Books, 1974, p. 13.

Van Til, William. "Futuristics: Crystal Ball for Curriculum" Nations Schools. March, 1972.

Van Til, William. ed. "Prologue: The Year 2000 Teacher Education" Curriculum Quest for Relevance 2nd ed. Boston: Houghton Mifflin Co. 1968, 1974. pp. 323-348.

APPENDIX

MANKIND 2000 PROJECT

An interesting account of the Delphi application is the "Mankind 2000 Project at the University of Illinois at Urbana. The Project is centered around PLATO (Programmed Logic for Automated Teaching Operations). The computer PLATO, a teaching machine which can be used both for instruction and psychological research is now being programmed for an evolutionary "exploration of possible futures for mankind 2000" called DELPHI. Osgood and Umpleby (1973) made the following comments on the project, explaining how the exploration is evolutionary in three respects:

1. The thinking of the people behind the project is still developing.
2. The actual programming of the exploration is going from the simple to the more complex.
3. When in operation, the explorers will learn in stages or periods just like other programmed learning exercises.

DELPHI

A SURVEY INTO THE FUTURE

Directions: Circle your choice.

1. In what year will the population in the U.S. exceed 300 million?

1980 1990 2000 2020 2040 NEVER

2. In what year will urban communities become carless?

1980 1990 2000 2020 2040 NEVER

3. In what year will there be no alarm over air pollution and urban crowding?

1980 1990 2000 2020 2040 NEVER

4. In what year will most houses be constructed of synthetic materials?

1980 1990 2000 2020 2040 NEVER

5. In what year will large-scale dismantling and demolition of New York, Chicago, Los Angeles, and Montreal take place and be rebuilt as three-dimensional developments?

1980 1990 2000 2020 2040 NEVER

Signature